

CROSS-SCALE COUPLING IN THE SOLAR ATMOSPHERE

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For understanding and eventually predicting solar activity, the fundamental question that Solar-C must answer is: How does energy transfer from the large-scales at which it is injected into the solar atmosphere to the small scales at which it is dissipated? We show that this question of cross-scale coupling is fundamental to all activity, ranging from the smallest nanoflares that are postulated to power coronal heating and solar wind acceleration, to the largest coronal mass ejections and eruptive flares. For the solar atmosphere, the most important process that actually dissipates the energy is believed to be magnetic reconnection. We present results on recent calculations of reconnection in a variety of solar contexts and focus on the coupling between kinetic and MHD scales during reconnection. We discuss the implications of our results for present data and for future observations from Solar-C.

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